British Columbia Provincial Economic Multipliers And How to Use Them

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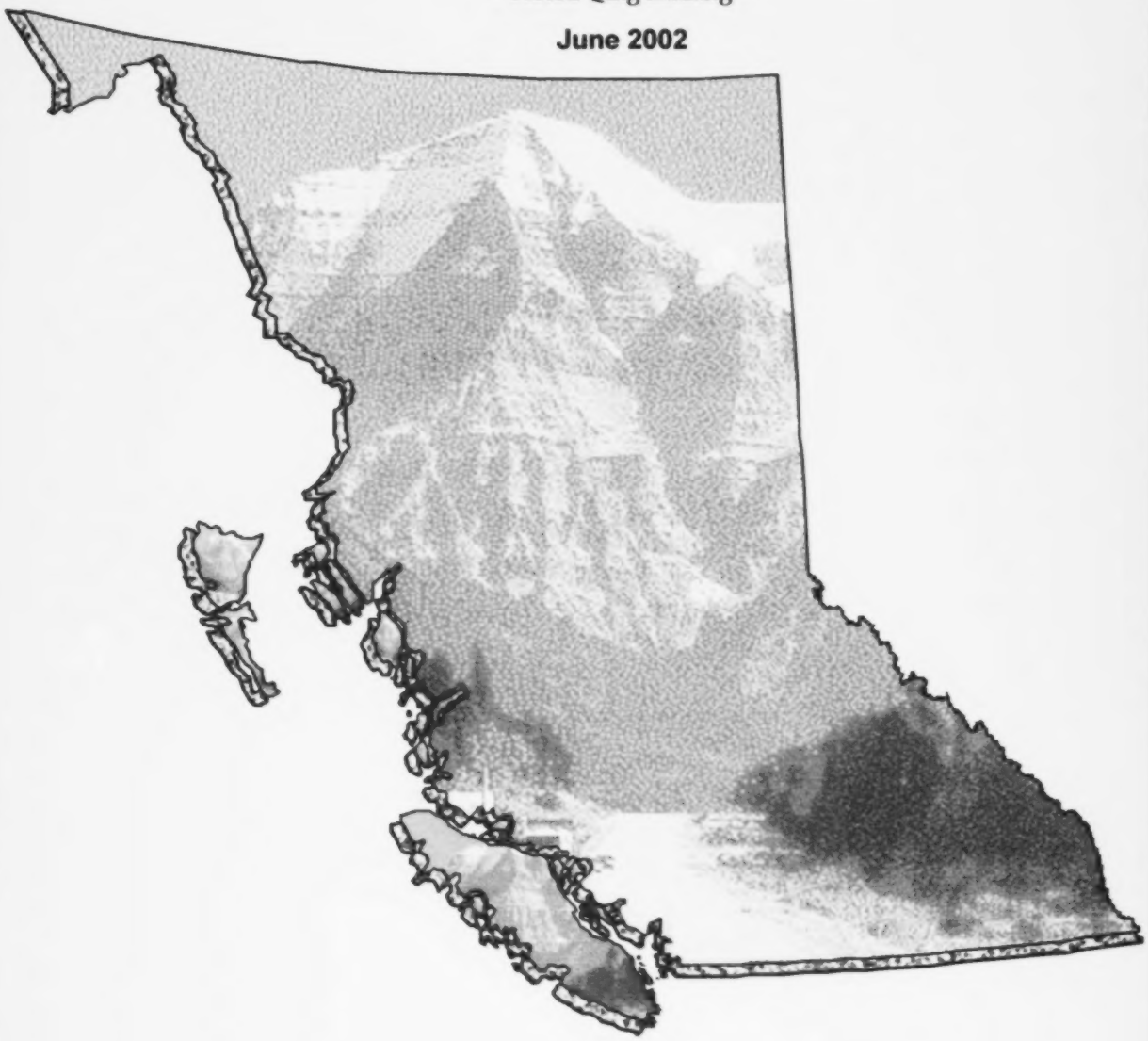

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Chapter 1: Introduction

The British Columbia government has maintained a provincial Input-Output Model for more than ten years. This model was developed and updated by BC STATS using data supplied by the Input-Output Division of Statistics Canada, at roughly five-year intervals. The model was also updated annually to account for the most recent employment information. The first model that BC STATS developed had 1974 as its base year. Subsequently, there was a 1979 model, a 1984 model, and a 1990 model with the current model year being 1996. Future updates should occur on an annual basis with the release of data from Statistics Canada.

During this period the model has been used for hundreds of studies, including the impacts of Free Trade, the Vancouver Island Gas Pipeline, the Kemano Completion Project, and land use planning studies for LRMP's throughout the province. Although economic impacts are not the only reason for undertaking projects or developing specific policies, those impacts are often important considerations and their estimation should play some part in any review of those projects or policies.

Indeed, as government requires its programs to become more accountable for results[1], those programs which claim to produce economic benefits will need to estimate them. Ascertaining whether or not the predicted benefits were achieved may not be easy, but defining their value in an economically valid and systematic way is at least a first step.

The estimation of economic impacts is often a complex and technically challenging task and may involve significant amounts of judgement on the part of the analyst. We often get calls from practising economists or consultants with the question "What is the multiplier for .....?" The purpose of this publication is to try to respond to that question in a way that is helpful and instructive, and yet fair to the discipline, the situation under study, and the ultimate recipients of the information generated. The fact is that sometimes a simple multiplier *is* all that's required, though even in these cases there are subtle nuances and traps that analysts ought to be aware of and avoid. This report provides information generated from the 1996 Provincial Input-Output model, and this data can be

1 *Enhancing Accountability for Performance: A Framework and an Implementation Plan*, Second Joint Report, Auditor General of British Columbia and Deputy Ministers' Council, April 1996.

used to calculate approximately 17,000 different multipliers[2] for the BC economy. (Small wonder that we instinctively wince when we get a request for ***the standard multiplier***.) This report also provides explanatory information and example analyses that should promote the correct selection and application of those multipliers.

There are many situations, however, when the best approach to economic impact estimation is not to use a multiplier, but to make use of the input-output model in a project-specific way. A secondary purpose of this report is to help analysts to recognize such situations and to invite them to contact BC STATS to request use of the model for their application.

Chapter 2 of this report provides an overview of the structure of the model and discusses some of the issues and limitations associated with its application. As much as possible we have tried to present the relevant information in non-technical terms, with some technical details provided in Appendices.

Chapter 3 describes the multipliers provided in this report. It is emphasized that different situations call for different multipliers, and the onus is put on the analyst to use the information provided to calculate the most appropriate one for their application. A number of examples are provided to assist this process.

Finally, there is a concluding section that describes a number of situations where use of the input-output model itself is much more appropriate than any of the multipliers found in this report.

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2 This estimate was arrived at by considering about 320 industry groupings, 3 model configurations, 6 different measures (employment, GDP, etc.) and 3 different ways of combining the information into multipliers depending on the question asked.

Chapter 2: The Input-Output Model

Even those of us who are total klutzes in the kitchen know that to make a cake we need a recipe and the appropriate ingredients: flour, eggs, butter, milk, sugar, chocolate, etc. We also need either electricity or natural gas to bake the cake. We can think of each of these ingredients as an input and the finished product, the cake, as the output.

But, of course, each of these inputs is the output of another recipe or process. For example, eggs are produced by chickens which require grains, vitamins, antibiotics, chicken coops, heat and labour inputs.

The British Columbia Input-Output Model (BCIOM) structures the business sector of the entire British Columbia economy in terms of who makes what and who uses what. In principle, the model contains the recipes for every output of the economy. Such a model is very useful in predicting how an increase in demand for the products of one industry will impact on other industries and therefore on the entire economy.

The Structure of the Input-Output Model

In the input-output model, the economy is simplified - the current version of the BCIOM assumes that 243 industries make or use 679 commodities. Both of these numbers are arbitrary. Larger numbers would permit more precision in the recipes - if cakes are lumped with bread and cookies, etc., in the category "bakery products", then the recipe will not be for cake, but some weighted average of the recipes for each item in the category. Difficulties in the collection and manipulation of the required information tend to keep the numbers down. Needless to say, earlier input-output models were much smaller, and even the smallest ones were not practical without computers.

Units

In order to avoid complications with units, everything in the BCIOM is measured in dollars. Thus, to return to the cake example, instead of the normal cookbook recipe that might specify 2 eggs, ½ cup of butter, 1 cup of sugar, 2 cups of flour, etc., the BCIOM recipe for a cake might say:

eggs	$0.15
butter	$0.45
sugar	$0.13
flour	$0.06

Mathematically and conceptually, this keeps everything straightforward and simple, but it does introduce a major assumption - that of constant relative prices.

As recipes are normally written, in terms of quantities, older recipes are as valid now as when they were conceived. However, a recipe expressed in dollar terms produces a strange-tasting cake if the relative prices of eggs, butter, sugar and flour change appreciably. Uniform price changes caused by a general inflation rate are not really a problem - in this case we might get a smaller cake from an old recipe, but it would still taste like cake.

In reality, of course, production processes in the economy use real recipes based on actual quantities. When there are relative price changes over time, the BCIOM should be updated to reflect them. If it isn't, the model will overestimate the impacts on commodities that have become relatively cheaper, and underestimate the impacts on commodities that have become more expensive.

Producers' Prices

A question we must ask is, does the 15 cents worth of egg required to bake our cake refer to the price we pay in the grocery store or the price the poultry farmer received for the egg? The price of an egg bought at the local store includes the cost of transportation, wholesale and retail mark-ups and various indirect taxes.

In input-output terminology, *producers' price* is the price of the egg from the farmer's point of view; *purchasers' price* is what the consumer pays. The additional costs - transportation, taxes, mark-ups - which make up the difference between the two types of valuation, are referred to as margins.

The prices in the model are valued in producers' prices - the price the farmer receives for his eggs. In the case of manufactured goods, this would be the price the producer receives for the product at the factory gate. What this means is that the recipe for cake in the BCIOM includes the items like transportation, wholesale trade and retail trade - which are costs incurred between the ingredient producers and the ultimate user.

The MAKE, USE and FINAL DEMAND Matrices

The raw data of the model is organized into three main matrices - *MAKE, USE* and *FINAL DEMAND*. The *MAKE* matrix specifies, for each commodity, the industries that produce that commodity. In many cases, the entire production of a given commodity is made by a single industry - for example, all coal is produced by coal mines. However, some commodities are produced by a number of industries. For example, *Other Meat, Fresh, Chilled, Frozen* (Commodity #57) is provided by three industries: *Livestock farms, Meat and meat*

products and *Wholesale trade*. A firm is usually allocated to an industry on the basis of its main product (in dollar terms).

The *USE* matrix enumerates the commodities used by each industry. For example, the *Livestock farms* industry requires 79 separate commodity inputs, the five largest of which are *Hay and straw, Complete feeds, Other operating surplus, Services incidental to agriculture* and *Wages and salaries.*

The *FINAL DEMAND* matrix shows the disbursement of commodities to various final users. There are 180 categories that specify consumer expenditures, capital expenditures on machinery and equipment and construction, changes in inventory, government expenditures, exports and imports.

Primary Inputs

Some commodities, principally wages and salaries, operating profits and indirect taxes, are designated as *primary inputs*. These are characterized in the *MAKE* matrix by all zeros (i.e. no industry makes these commodities - in that sense they are "primary"). These commodities are also referred to as *value-added* because, for any given industrial process, they constitute the portion of the output that is not linked to other industries via commodity production. The sum of the value-addeds for all industries in the economy is an estimate of the total gross domestic product (GDP) for the economy.

Imports

If we were creating an input-output model for the entire world, there would be no need to specify imports or exports, and our model would merely reflect the inter-industry linkages. Thus, in such a model, activity in the bread sector would necessarily lead to activity in the field crop sector; or activity in the aluminum sector would generate activity in the bauxite sector.

However, in many cases, we are particularly concerned with the activity generated in domestic industries - in the case of the BCIOM, with industries in British Columbia. For this reason imports need to be considered.

The BCIOM accounts for imports by associating a fraction, called the import ratio, with each of the 679 commodities in the database. For example, the import ratio for *Soybeans and other oil seeds* is 1.0, indicating that all soybeans are imported. On the other hand, the import ratio for *Fuelwood and other crude wood* is 0.0, indicating that the model will assume that all fuelwood in the BC economy is produced in BC. Other examples:

eggs are assumed to be 14% imported
butter is assumed to be 78% imported
sugar is assumed to be 14% imported
flour is assumed to be 77% imported

The import ratios used in the model are the result of studies of inter-provincial and international trade. They may not be correct in each and every instance and they may be out of date, but they do tend to reflect the strengths in the domestic economy.

The Impact Matrix

The *MAKE* and *USE* matrices are combined mathematically[3] to create the impact matrix which specifies how a unit change in the output of each industry affects the output of every other industry. If import ratios are not taken into account then the resulting impact matrix is said to be "without leakages". Normally, however, these leakages are included in the computation of the impact matrix so that it reflects only the impacts on the domestic economy.

For example, the impact matrix specifies that a $1 increase in the *Furniture and Fixture industries* (Industry #18 in the Medium Aggregation) has a total impact of $1.52 on domestic output, and the ten most affected BC industries are:

Furniture and Fixture industries	$1.00281
Wood industries	$0.11182
Wholesale Trade	$0.06531
Logging and Forestry	$0.05058
Travel & enter., advertising & promotion	$0.03888
Operating, office, cafeteria & lab supplies	$0.03562
Finance & real estate	$0.03045
Business Services	$0.02430
Transportation	$0.01556
Printing, publishing & allied	$0.01454

Open and Closed Models

The impact matrix just described combines the direct and indirect domestic effects of a unit change in exogenous or final demand. The direct effects are what we start with, and the indirect effects result entirely from backward industrial linkages in the domestic economy. There is a backward linkage from the *Door, Window and Other Millwork* industry to the *Sawmill* industry, and from the

3 The mathematical derivation of the input-output model may be found in the Statistics Canada publication, *The Input-Output Structure of the Canadian Economy* (catalogue #15-510).

Sawmill industry to the *Logging* industry. If the impact matrix estimates direct and indirect effects only, we say we are using an *open model*.

There is another kind of effect arising from an increase in domestic economic activity, however, and this is due to the spending of increased household income. These effects are referred to as **induced impacts** in the input-output model.

In the economy, the people who earn this additional income are assumed to spend it in a provincially average kind of way. However, first the amount to be spent is reduced by taxes and savings. Because the commodities bought with this increased household income include imported items, there is further leakage from the domestic economy. At the same time, however, a portion of these domestic expenditures lead to additional production and therefore increased BC personal income which is assumed to be spent on goods and services, etc. The *closed* version of the BCIOM takes these induced impacts into account.

It is important to note that the inclusion of induced impacts is not always appropriate. (In fact, Statistics Canada does not estimate induced impacts at all.) Great care must be taken not to double-count economic impacts. If total impacts - direct, indirect and induced - were calculated for every industry sector in the BC economy, the end result would add up to more than the entire economy. In general, if the direct impact of a project can be attributed to another industry as an induced impact, it is not appropriate to estimate its induced impacts. For example, the activity generated by resident sports fishermen who receive their wages from the forest industry is considered to be induced activity of the forest sector, as well as direct activity of the sports fishing sector. If, however, a tourist from Alberta fishes in BC while on vacation, this activity may be attributed to the sports fishing industry. Guidelines regarding whether or not to include induced impacts are discussed in Chapter 3.

The With Safety Net and No Safety Net Scenarios.

There are two ways of looking at induced impacts - the *With Safety Net* and *No Safety Net* scenarios. These are also referred to as the *Short-run* and *Long-run* or *No Migration* and *Migration* scenarios and they represent the two extremes of the impacts of a project.

One way of describing the No Safety Net (or Migration or Long-run) scenario is that, based on the assumption that there is no social safety net, those who do not earn wages have no income. All new jobs are assumed to be filled by people who previously earned no income in BC or, in the case of a negative impact, the income of everyone who loses their job drops to zero. Another way of looking at it is that everyone who loses their job leaves the province and every new job is

filled by someone who moves into the province from somewhere else. In the long run, if people are out of work in one area, presumably they will eventually move somewhere else in the hope of finding employment.

The With Safety Net (or No Migration or Short-run) scenario assumes that those who lose their jobs stay in the province and collect Employment Insurance or social assistance or use their savings; new jobs are filled by people formerly receiving assistance. In the short run, anyone who loses their job is most likely to stay where they are.

Limitations of the Input-Output Model

Compared to the complexity of actual economic systems, input-output models present a simplified account of economic interdependence. Input-output models are not unique in this because all models of economic behaviour represent a simplification of reality. The following limitations should be considered when reviewing results from the model.

1. The relationships of input-output models are simple proportionalities that implies that ***marginal changes are equal to average changes***. This feature makes input-output models convenient to use; however, under many circumstances, proportional relationships may not be appropriate. For example, economies or diseconomies of scale cannot be represented.

2. ***Increases and decreases show the same proportional impact*** whereas, in reality, the disappearance of a particular expenditure does not generate a slowdown in the economy equal to its total economic impact, unless all funds originate from abroad. This is because at least some of the amount saved will be reinjected into the domestic economy.

3. Input-output models are static models - ***time is not explicitly represented***. Input-output methodology measures the total economic impacts on major economic variables after an exogenous event has taken place. The model does not calculate the amount of time required for the propagation of all effects.

4. Input-output models are exclusively flow models and ***stocks are not represented***. Indeed, the introduction of the concept of stocks would require explicit representation of time. As a result, it is necessary to assume that all intermediate goods can be produced without additions to capital stock.

5. Supply and demand factors cannot be handled simultaneously. Implicit in input-output models is the assumption that ***supply is perfectly elastic***. Thus, any increase in demand for goods and services would lead the producing industries to increase their output by an equal amount to

satisfy that demand. It is also assumed that these producing industries have no difficulty in obtaining the necessary inputs for their new level of output. These inputs include not only the intermediate inputs of domestic goods and services but also labour and imports. If a shortage or bottleneck of economic resources develops in one or more sectors, this may precipitate inflationary activity (i.e. relative price changes), substitution effects or changes in import proportions. Any one of these results could subsequently change the overall economic impact.

6. Another basic assumption is that ***all industries are operating at full capacity*** with regard to employment. Hence, any increase in output would require a further proportional demand for labour services. This assumption implies that no industry will meet a new demand for its goods and services with its existing labour force. Therefore, the employment level in the economy is assumed to change in proportion to the increased output in each industry.

7. Although input-output analysis incorporates the provincial economic structure and linkages, it often ***ignores any economic displacement that may occur in existing industries as new projects are completed***. Economic gains in these new projects should be tempered by an estimation of subsequent contractions or losses in existing plants or industries. Further contractionary effects on economic activity may result from the recovery of funds used to finance a particular project, either through increased taxation or repayment of borrowed capital. Any displacement effects arising from financing a project should be taken into account in an overall project cost-benefit analysis.

8. Input-output models ***do not consider the nature of the expenditure, its social impact, nor the externalities that may be generated***. Hence, one cannot conclude about the social/economic profitability of an investment solely on the basis of the results provided by input-output simulations.

9. ***The industrial structure and linkages are based on 1996 revised data***. The choice of year was dictated by the availability of provincial statistics and the database developed by Statistics Canada for the Canadian Interprovincial Model. Use of this data base implicitly assumes that the technology of producing goods and services, input patterns and the relative prices of various goods and services remain unchanged from values in the base year of 1996. It further assumes that there are no new products that might require a different production technology or input mix. Employment impacts, however, do take account of changes in labour productivity and wage rates by incorporating more recent employment information.

Opportunity Costs

Opportunity costs are the costs associated with missed opportunities. This concept is important when evaluating the effect of government expenditures. If the same tax dollars were channelled into another project there would be economic impacts. If those tax dollars were not collected and stayed in the pockets of BC residents instead, they would be recycled into the economy as consumer spending and would also create economic impacts in this way. It may be difficult to evaluate the alternatives, but they should not be ignored.

Chapter 3: Multipliers

Different situations call for different multipliers. Using a multiplier is easy; knowing which multiplier to use can be a challenge. Before using a multiplier to answer a question, it is very important to know exactly what the question is.

If we think of the economy as a pie with each of the various industries having a piece of the pie, one type of question involves estimating the size of the pieces associated with the different industries. For this type of question, it is important to recognize that the pie doesn't get any bigger - what one industry gains, other industries must lose since the shares cannot add up to more than one pie. Questions of this type are called "allocation questions" and to answer them, it is important to use a procedure so that if we applied it in the same way to each industry the shares would add up to 100%. Unfortunately, **the numbers in the tables of this publication cannot be used to answer allocation questions**.

However, there are times when the analyst may want to know the impact of a new development that will increase the size of the economic pie. (Similar reasoning applies to changes that decrease the size of the pie). In this case, the question is about how much bigger the whole pie will get as a result of the new development. This is a fundamentally different question than the allocation question. As will be described below, the numbers in the tables of this report can be used to derive multipliers to answer questions of this kind in a number of ways.

Another consideration is whether to use *Open* or *Closed* model results. The Open Model can always be used - it treats personal spending by wage-earners as exogenous and never leads to contradictions or inconsistent results. Induced impacts are always zero if the Open Model is used.

The Closed Model, however, is more difficult to justify in many situations. For example, it is intuitively dubious to estimate the induced impacts of an activity that would itself be largely driven by consumer spending. (The model, and the tables in this report derived from it, can certainly be used to carry out the required calculations, but interpretation of the results will always be problematic.)

Thus for applications which involve exports or capital spending, either the Open or Closed Model can be used and the results interpreted accordingly. However, when changes in demand are caused by domestic personal expenditures, in whole or in part, only the Open Model makes sense.

Determining Which Multiplier to Use

Demand-driven commodity solutions are the "natural" way to use the input-output model. A project is broken down into a series of commodity purchases that are then run through the model. The numbers on the following tables, however, are *industry* multipliers. They represent the impacts on the entire economy of an increase or decrease in domestic production of $1 (except employment, which is for $1 million in a particular industry). To relate this to the commodity solution, the industry solution approach assumes an average or typical pattern of commodity purchases to produce the required output (the average 1996 "recipe" for each industry as described in Chapter 2.).

For each type of impact (output, GDP at factor cost, employment and taxes) direct, "own indirect", total indirect and two types of induced impacts - with and without safety net - are displayed. There is no column for direct output; by definition, this is 1.00.

"Own indirect" refers to indirect impacts of an industry on itself. Industries have indirect linkages not only to other industries but also to other firms within the same industry. When industries are very disaggregated, an industry's linkages to itself are minimal. The more highly aggregated an industry is, though, the more pronounced the effect. These "internal linkages" are important in understanding the different types of multipliers.

Multipliers for medium and small industry aggregations are provided. There is some overlap between the different aggregations. For example, the *Agriculture and related services* industry appears on both the small and medium aggregation tables. *Fishing and trapping* also remains separate from other industries in both aggregations.

The data on which the BCIOM is based is collected by Statistics Canada from firms in each industry with the understanding that the information will remain confidential, so that, for example, one firm in a two-firm industry will not be able to figure out its competitor's statistics by subtracting its own data from the totals. This requirement means that some industries in the large aggregation need to be suppressed. For this reason, only the medium and small aggregation tables are released in this publication. However, it is important to understand that these aggregated results have been developed from a large-aggregation model. Stated simply, a medium aggregation multiplier is computed by disaggregating the assumed direct impact into its large aggregation components (using total 1996 revenues as relative weights), then applying the large aggregation impact matrix, and finally re-aggregating the results for the medium (or small) aggregation

tables. This procedure is more accurate than just working with a medium aggregation impact matrix.

Most industry input is reported in considerable detail. There are, however, several catch-all categories such as office supplies, laboratory supplies, advertising and promotion, etc. which are made up of many input-output commodities. It is not possible to estimate the detailed commodity content of these for each industry, so to handle these inputs the notion of *fictive industries* is used. In the medium aggregation, these are: 48 Operating, office, cafeteria and lab supplies, 49 Travel, advertising and promotion and 50 Transportation margins. Multipliers for the fictive industries have been included in the tables, but it should be noted that because of their artificial nature, they have no direct employment or GDP.

As mentioned at the beginning of this chapter, different situations require different multipliers. Normally, the numerator will be "total *whatever*", where *whatever* may be output (which is equivalent to total revenues), or GDP at Factor Cost, or employment, or taxes. The purpose for which the multiplier is needed will determine the denominator. If the analyst knows the "new" revenues attributable to this project then the denominator will just be 1. However, if observation has revealed a total industry revenue increase, then the appropriate denominator will be '1 + Own Indirect Output'.

This is subtle. Consider the following two cases which reveal this distinction.

1. Due to the launch of a new product line, the XYZ Insurance Company is expected to increase its revenues by $20 Million. In this case the appropriate Open Model output multiplier is 1.87. (See industry #39 in the Medium aggregation.)

2. After a change in regulations concerning the insurance industry, its overall revenues are down by $12 Million. In this case the appropriate Open Model output multiplier is 1.87/1.02 = 1.83. (If we used 1.87, we would be overestimating the impacts by counting the secondary impacts on the insurance industry twice.)

Impacts of Wages and Salaries

There may be times when the analyst needs to know the impact generated by personal income. This might arise, for example, when considering the impacts of a change in personal income tax rates. Below are the induced impacts, both with and without safety net, of $1 million of wages and salaries. There are no indirect impacts associated with wages and salaries. It has been assumed that there is a 25% leakage to items such as taxes and savings.

	With Safety Net	*No Safety Net*
Output	$812,337	$922,845
GDP at Factor Cost	$453,059	$514,692
Employment, 2000	7.31 jobs	8.30 jobs

Tourist Spending

Tourism is unique among the major industries for a number of reasons. One is that it cannot be found anywhere in the multiplier tables at the end of this report. However, in those tables you can find the industries that are directly impacted when tourists spend money – *Accommodation Services, Food and Beverage Services, Transportation, Recreation Services,* and *Retail Trade.*

So what is the best way to proceed when the impacts of tourist spending are required? The analyst first needs to decide how much is spent on each of these industries and then applies the appropriate multipliers on an individual basis – the total impact is just the aggregate of the individual impacts.

However, there are a couple of additional complications that are unique to Tourism. Firstly, and probably most significant, is that when tourists spend money they must pay commodity taxes on the purchases that they make. For example, if a tourist spends $50 on a meal in a restaurant, some of that money will go to PST and some will go to GST, and what is left will be a direct impact on the Food and Beverage Services sector. The multipliers in this publication can be used to estimate any additional federal or provincial taxes incurred from that point on, but at present DO NOT automatically estimate what might be called the front-end taxes. Thus before the analyst hits each of the tourist impacted industries he/she should first estimate and subtract out the front-end taxes. At the end of the analysis these amounts can then be added back into the estimates of government revenues. Table 1 below provides average rates for these various taxes.

Table 1: Front-end Tax Rates (per cent)

Industry	GST	PST	Other Federal Comm. Taxes	Total Front-end Taxes
Accommodation	4.41	5.46	0	9.87
Food & Beverage	6.21	1.55	0	7.77
Local Transport	5.30	0	0	5.30
Recreation	6.13	0	0	6.13
Retail Trade	5.26	13.92[4]	6.94	26.12

The final complication is that when tourists purchase goods, the money does not all go to domestic industries which produce goods nor does it all go to the retail trade sector. As noted earlier, some of it is taken off the top as federal and provincial taxes, some of it goes to the retailer (the retail margin), some of it goes to the wholesaler (the wholesale margin), and what is left goes to the producer, who may be domestic or foreign.

Table 2 below is based on the tax and trade margins associated with an assumed "basket" of tourist goods.

Table 2: Tourist Spending on Goods: Where the Money Goes

	Percentage
Provincial Sales Tax	13.9
Federal GST	5.3
Other Federal Taxes	6.9
Retail Margin	28.4
Wholesale Margin	6.5
Production	39.0
Total	**100.0**

The information in this table can be used to estimate the front-end taxes on goods purchases by tourists as well as the direct impacts on the trade industries. Generally, the retail impact would be considered direct whereas wholesale and its spinoffs would be considered indirect. Finally the amount of domestic production and its impacts (all considered indirect) can be estimated from the following table. For each dollar of production for tourists, the table shows the

4 The astute reader may wonder why this rate is so high given that the nominal PST rate is 7.5%. The reason is that tourists are assumed to buy cigarettes and other tobacco products and the provincial taxes on these products are so high that the weighted average rate on all products that tourists are assumed to buy becomes 13.92%.

corresponding BC impacts (as in the general multiplier tables, the employment impacts correspond to $1 million of production for tourists). Note also that not all of the production for tourists occurs in British Columbia – the estimated impacts in the tables below take into account assumptions about the import content of goods purchased by tourists.

Table 3: Industry Multipliers: Production for Tourists

Output			GDP			Employment		
Indirect	SN[5] Induced	NSN Induced	Indirect	SN Induced	NSN Induced	Indirect	SN Induced	NSN Induced
0.28	0.03	0.08	0.13	0.02	0.04	3.1	0.3	0.7

Table 4: Government Revenue Multipliers: Production for Tourists

Federal Government Tax				Provincial Government Tax				Municipal Government Tax			
SN Indir.	NSN Indir.	SN Induc.	NSN Induc.	SN Indir.	NSN Indir.	SN Induc.	NSN Induc.	SN Indir.	NSN Indir.	SN Induc.	NSN Induc.
0.006	0.009	0.002	0.006	0.005	0.006	0.002	0.006	0.002	0.002	0.001	0.002

Examples

Example 1

A new marketing strategy is expected to increase production in the soft drink industry by $1 million. What are the impacts on the BC economy?

Because the tables show the impacts of an increase or decrease of $1 of output, estimating the impacts of the $1 million increase in the output of the soft drink industry is a simple case of adding the direct and indirect multipliers found on Row 9 of the medium aggregation table on Page 30 (induced impacts are not counted because production will be for domestic consumption) and multiplying the sum by $1 million, the magnitude of the increase in output. The total impacts on the BC economy will be:

5 In these tables, as in the tables at the end of this report, SN stands for "with Safety Net" and NSN stands for "No Safety Net".

Output: (1.00 + 0.67) x 1,000,000 = $ 1,670,000
GDP: (0.32 + 0.24) x 1,000,000 = $ 560,000
Employment: 4.7 + 4.3 = 9.0 jobs

Provincial Government Revenue: (using multipliers from Row 9 on Page 33)

With Safety Net: 0.026 x 1,000,000 = $ 26,000
Without Safety Net: 0.031 x 1,000,000 = $ 31,000

Example 2

Suppose example 1 were modified as follows. A new marketing strategy is expected to increase revenues for the soft drink industry with employment in this industry expected to rise by 100. What are the impacts on the BC economy?

First, estimate the employment impacts. The increased revenues are a direct impact as are the 100 additional jobs. The denominator will be *direct*. The inclusion of induced impacts is not appropriate since this involves domestic consumption only. The numerator will be *direct + indirect*.

And so, the employment multiplier is (4.7 + 4.3)÷4.7 = 1.91 and the total employment impact in BC is 100 x 1.91 = 191. A total of 191 jobs (including the 100 direct jobs) are gained as a result of the new marketing strategy.

From the multiplier tables, we see that a $1 million increase in output in the soft drink industry creates 4.7 additional direct jobs. Therefore, it will take $21.3 million to generate 100 direct jobs and the following impacts.

Output: (1.00 + 0.67) x 21,300,000 = $35,570,000
GDP: (0.32 + 0.24) x 21,300,000 = $11,928,000

Provincial Government Revenue:

With Safety Net: 0.026 x 21,300,000 = $554,000
Without Safety Net: 0.031 x 21,300,000 = $660,000

Example 3

The residential construction sector is losing 200 jobs per year. What is the impact on the BC economy?

First, consider the employment impacts. The 200 jobs include all jobs in construction - both direct and indirect. The denominator will be *direct + own indirect*. Residential construction is driven entirely by domestic consumption, therefore induced impacts are not appropriate. The numerator will be *direct + total indirect*.

Look at the results for construction (Row 30) on the medium aggregation table on Page 30; the multiplier is (9.38+4.00)÷(9.38+0.05) = 1.419. The total employment impact is 200 x 1.419 = 284. About 84 jobs are lost in the rest of the BC economy.

Next, consider the other impacts on the economy. There are 200 jobs in the direct and own indirect categories. The multiplier for own indirect is 0.05, so 199 of the 200 jobs are direct. From the multiplier tables, we see that a $1 million decrease in output in construction results in 9.38 fewer direct jobs. Therefore, it will take $21.21 million (199÷9.38) to reduce the number of direct jobs by 200 and generate the following impacts:

Output: (1.00 + 0.52) x 21,210,000 = $32,239,200
GDP: (0.39 + 0.23) x 21,210,000 = $13,150,200

Provincial Government Revenue: (using multipliers from Row 30 on Page 33)

With Safety Net: 0.064 x 21,210,000 = $1,357,400
Without Safety Net 0.072 x 21,210,000 = $1,527,120

Example 4

The Japanese are going to increase imports of squidgeon (a mythical fish delicacy found along the BC coast). The BC fishing industry (Industry # 2) will expand and employ 100 additional FTE's. What are the impacts on the rest of the BC economy?

We cannot discern how many of the additional jobs in the fishing industry are direct and how many are indirect, so the denominator of the multiplier will include both *direct and own indirect*.

There is an increase in export activity - new money will be flowing into the province, so it is appropriate to include induced impacts. The numerator will be *direct + indirect + induced*. In the closed model, there are two approaches - the With and Without Safety Net scenarios. A range of the likely impact is estimated using the multipliers from Row 2 of the medium aggregation table on Page 30.

With Safety Net: (6.7 + 3.6 + 1.2) ÷ (6.7 + 0.4) = 1.62
1.62 x 100 = 162 jobs in total
Without Safety Net: (6.7 + 3.6 + 2.9) ÷ (6.7 + 0.4) = 1.86
1.86 x 100 = 186 jobs in total

Other economic impacts: if there are 100 jobs in the direct and own indirect categories, then there are [6.7÷(6.7+0.4)] x 100 = 94 direct jobs. From the multiplier tables, we see that a $1 million increase in output in fishing and trapping results in 6.7 direct jobs. Therefore, it will take $14.03 million to increase the number of direct jobs by 94 and generate the following impacts.

(The provincial government revenues are estimated using the multipliers from Row 2 of the medium aggregation table on Page 33.)

With Safety Net:

Output: (1.00 + 0.53 + 0.13) x 14,030,000 = $23,289,800
GDP: (0.49 + 0.21 + 0.07) x 14,030,000 = $10,803,100
Prov Govt Revenue: (0.034 + 0.013) x 14,030,000 = $659,410

Without Safety Net:

Output: (1.00 + 0.53 + 0.32) x 14,030,000 = $25,955,500
GDP: (0.49 + 0.21 + 0.18) x 14,030,000 = $12,346,400
Prov Govt Revenue: (0.039 + 0.034) x 14,030,000 = $1,024,190

So, the economic impacts of this increase in squidgeon exports are estimated to be:

Output: $23.3 - 26.0 million
GDP: $10.8 - 12.3 million
Employment: 162 - 186 jobs
Prov Govt Revenue: $0.7 - 1.0 million

Example 5

A new convention centre built in Vancouver is expected to increase tourist spending by $1 million. What are the impacts on the BC economy?

There are a number of steps in the recommended procedure. These are first itemized below and then followed through for one type of impact (on total Output for the NSN case).

1. Somehow the analyst has to begin by allocating the single gross figure for tourist spending ($1 million in this case) to the individual categories (Accommodation, transportation, food services, etc.) In the absence of case-specific information, Table 5 below is offered as a guide.
2. Use Table 1 on Page 14 to estimate the front-end taxes on these expenditures.
3. Subtract the front-end taxes from the total revenues received by each tourist industry.
4. For all of the tourist expenditure categories except Shopping apply the appropriate multipliers to get the indirect and induced impacts by industry.

5. In the case of Shopping, there is an additional step using Table 2 because the money spent by tourists on goods purchases is actually distributed to 5 distinct destinations:
   - Front-end taxes
   - Retail margins (which go to the retail industry)
   - Wholesale margins (which go to the wholesale industry)
   - Imported goods
   - Domestically produced goods
6. Indirect and induced impacts for Retail Trade can be estimated using the appropriate multipliers for that industry. Wholesale trade impacts can be estimated in the same way, except that even the direct impacts on the wholesale trade industry are treated as indirect (from the perspective of the original tourist spending).
7. Indirect and induced impacts of the tourist purchases of domestic goods are estimated using the appropriate multipliers in Tables 3 and 4.

Back to the example. Without further information regarding the pattern of tourist spending, we assume that it is attributable to five tourist categories as suggested in the Vancouver row of table 5 *Distribution of Total Expenditures by BC Resident Tourists*: $150,000 to the Accommodation industry (Industry # 44), $320,000 to Food & Beverage (Industry # 44), $140,000 to Local Transportation (Industry # 31), $90,000 to Recreation (Industry # 45), and $100,000 to Retail purchases. (Note that we have left out the 20% of tourist spending on "other expenses", so our estimate will be conservative.)

Table 5: Distribution of Total Expenditures by BC Resident Tourists (per cent)

BCVS Tourism Area	Accom.	Food & Beverage	Local Transport	Recreation	Retail	Other Expenses
1 East BC Rockies	18	34	23	10	5	10
2 West BC Rockies	20	39	15	15	3	7
3 South Thompson-Okanagan	17	35	16	14	5	13
4 Vancouver Coast & Mountains	19	34	14	10	8	15
5 Vancouver Island	21	29	26	14	4	6
6 North Thompson-Okanagan	19	31	14	13	7	15
7 Cariboo	18	32	18	9	3	20
8 Northwest	18	30	21	11	7	12
9 Northeast	13	23	23	8	7	26
10 Victoria	18	32	14	9	9	19
11 Vancouver	15	32	14	9	10	20
12 Whistler	20	27	11	14	13	15

Source: BC Local Area Economic Dependencies and Impact Ratios - 1996, taken from British Columbia Visitor Studies.

Now, using the rates in Table 1 on Page 14 calculate the front-end taxes collected from this increased tourist spending by each category. The remainder of the spending is treated as the direct output impact on each industry.

Tourist Industry	Front-end Taxes	PST paid as Front-end Taxes	Output Impact
Accommodation	$14,805	$8,190	$135,195
Food & Beverage	$24,864	$4,960	$295,136
Local Transport	$7,420	$0	$132,580
Recreation	$5,517	$0	$84,483
Retail Trade	$26,120	$13,920	$73,880
Total	**$78,726**	**$27,070**	**$721,274**

Next, use the industry multipliers in the medium aggregation table to estimate the impacts of the remainder on the BC economy. Tourists are those who travel to and stay in places outside their usual environment. Therefore, tourist spending does bring funds into the province from the outside world. Thus, the induced impacts should be considered in this case.

Because we have multipliers only for the aggregate industry of Accommodation and Food Services we can at this point combine those direct impacts (i.e.

135195+295136 = 430331). Similarly, we must use the transportation industry multipliers for the Local Transport expenditures because there is no "local transport multiplier" in the medium aggregation tables.

Applying Output multipliers to the output impacts in the above table results in the following table

Industry	Output Impacts			
	Direct	Indirect	NSN Induced	Total
Accommodation & Food Services	430,331	180,739	193,649	804,719
Transportation	132,580	83,525	57,009	273,114
Recreation	84,483	53,224	36,328	174,035

As was mentioned earlier, the case of Retail Trade is a little more complicated, since more than one industry is directly impacted by tourist spending on this category. According to Table 2 in the "Tourist Spending" section, the total $100,000 tourist spending on Retail Trade is split into different taxes and industries as listed below.

Provincial Sales Tax	$13,900
Federal GST	$ 5,300
Other Federal Taxes	$ 6,900
Retail Margin	$28,400
Wholesale Margin	$ 6,500
Production for Tourists	$39,000

The total economic impacts of the $28,400 retail trade sector revenue can be estimated using the multipliers for Industry # 37. These multipliers are 0.50 for indirect and 0.56 for NSN induced. Similarly, the total economic impacts of the $6,500 wholesale trade sector can be estimated by using the multipliers for industry # 36. These multipliers are 0.51 for indirect and 0.49 for NSN induced. In view of the nature of wholesale trade, however, even the direct activity here ($6,500) is treated as indirect.

Finally, the multipliers provided in Tables 3 and 4 on page 15 can be used to estimate the domestic economic impacts of the production for tourists.

With Safety Net:

Output (0.28 + 0.03) x 39,000 = $12,090
GDP: (0.13 + 0.02) x 39,000 = $5,850
Employment: (3.1 + 0.3) x 0.039 ≈ 0.13 jobs
Prov Govt Revenue: (0.006 + 0.003) x 39,000 = $351

Without Safety Net:

Output: (0.28 + 0.08) x 39,000 = $14,040
GDP (0.13 + 0.04) x 39,000 = $6,630
Employment: (3.1 + 0.7) x 0.039 ≈ 0.15 jobs
Prov Govt Revenue (0.007 + 0.008) x 39,000 = $585

We can now enlarge the Output Impacts table by including these additional effects associated with shopping by tourists.

Industry	Output Impacts			
	Direct	Indirect	NSN Induced	Total
Accommodation & Food Services	430,331	180,739	193,649	804,719
Transportation	132,580	83,525	57,009	273,114
Recreation	84,483	53,224	36,328	174,035
Retail Sector	28,400	14,200	15,904	58,504
Wholesale Sector	-	9,815	3,185	13,000
Production	-	10,920	3,120	14,040

In the same fashion, the impact of the affected tourist industries on the BC economy can be estimated for the other parameters of interest, and the results are listed in the following table.

Tourist Ind.	Output, $	GDP, $	Employment	Prov Govt Rev., $
Acc., food & bev	688,529 - 804,719	344,265 - 408,814	9.77 - 10.83	29,262 - 43,894
Local Transport	239,969 - 273,114	107,390 - 125,951	1.84 - 2.14	7,955 - 12,595
Recreation	152,914 - 174,035	68,431 - 80,259	1.56 - 1.76	5,153 - 8,026
Shopping	72,337 - 85,544	37,544 - 43,056	0.97 - 1.09	2,737 - 4,427
Total	**1,153,749 - 1,337,412**	**557,630 - 658,080**	**14.14 - 15.82**	**45,107 - 68,942**

Finally, note that the provincial government revenue column in the above table has been calculated only for the internal workings of the BC economy – i.e. after the front-end taxes have been paid. If we include those provincial government revenues then the total provincial government revenue estimate for the scenario under study is $27,070 + 45,107 = $72,177 for the SN case and $27,070 + 68,942 = $96,012 for the NSN case.

When Not to Use these Multipliers

There are times when the use of the particular multipliers developed in this report is not appropriate.

- when trying to answer industry share questions, e.g. how big is our industry compared to others, when linkages and dependencies are taken into account. To answer these kinds of questions the model needs to be solved in a different way.
- when a recycling rate of 75% is not appropriate. The recycling rate is the fraction of household income that is recirculated in the BC economy after allowing for leakages due to taxes and savings. It may not be appropriate, for example, if the project labour force is working in BC but actually residing in Alberta, and sending pay-cheques home to their families.
- when the "industry average" production function is not appropriate. When detailed information about project expenditures is known, it is far better to use it rather than the default production functions in the input-output model. The data in the model is based on provincial averages (and for 1996, at that) and is unlikely to be accurate for a specific project.
- when the import ratios for important inputs differ significantly from the BCIOM assumptions.
- When the medium (or small) aggregation industry in the tables is not likely to be a good representation of the industry directly impacted in the study scenario. For example, the dairy industry is part of Agriculture and Related Services (#1), but the production function ("recipe") for the latter is probably not a good recipe for the dairy industry.

Appendix A: Employment Ratios

It is unthinkable to have an input-output model which is not capable of estimating employment impacts, even though employment is an add-on to the model and not really integral to the development. Job to income ratios are used to estimate employment impacts in the 1996 BCIOM. This appendix describes how these ratios were derived.

Data Sources

The following data sources were used:

1. 1996 Labor Force by 285 industries from the 1996 Canadian Census.
2. 1996 Total Income by 285 industries from the 1996 Canadian Census.
3. Wages & salaries by 243 industries from the IO USE matrix, 1996 BCIOM.

Statistics Canada did not provide employment estimates with the other information needed to build the 1996 IO model, therefore, it was necessary to make use of other data. In fact, we had estimated the job to income ratios in the 1990 model. The industry set, however, had changed in the new model, and increased in number from 216 to 243. Thus, simply updating these old ratios by using the CPI as a measure of wage inflation did not seem to be appropriate. We finally made decision to use the detailed labor force figures from the 1996 Canadian Census, since it was the best source of data available for the employment estimation in the 1996 IO model.

It is noteworthy that the same data purchase also provided us with employment figures. However, we made the decision to use labor force and not employment because of how these separate estimates are revealed by the Census: the labor force figures count those individuals who worked in a particular industry within the last year, i.e. in the period June 1995 to June 1996; whereas the employment figures count only those individuals who worked in the industry in the week proceeding the Census. Consideration of these differences suggest that the labor force figures are more robust and less vulnerable to short-term fluctuations or seasonal variations.

Census/IO Concordance

There were 285 industries in the Census database, but only 243 in the IO model. Therefore, in order to use the information from the former one for the estimation in the latter one, we first needed to build a concordance of these two.

Of the 243 IO industries 121 appeared to be represented identically in the Census database. In addition, another 21 industries were the sum of two or more Census

industries. The allocation of Census employment figures to these 121 + 21 =142 industries was straightforward. But situations were more complicated for the remaining 101 industries, where the Census provided one number while the IO required two or more. In such situations, we needed to split the employment figure in one Census industry into two or more IO industries. How to make the best split of the figure was a problem that required a lot of thought. Without other sources of information about the industries, this problem was finally tackled by making the simplest assumption -- that within each of the Census groupings, which needed to be split, the average wage would be the same. In other words, we assumed that within each group all industries had the same job to income ratio and that the jobs would be distributed among them in exactly the same way that the wages were distributed among them. The concordance between the Census and the IO industries was built through three steps. The following section explains in detail how this was done.

Job to Income Ratios

A new industry set called Aggregate Industry was generated to aggregate the Census industries and connect them to the IO model. We set up a matrix called IMATRIX to specify the assignment of industries from the Census to the Aggregate Industry, while AVECTOR is a new vector created to specify the concordance between the Aggregate and the IO model.

First, we assigned one or more Census Industries to each of the Aggregate industries in the way specified by the IMATRIX. Secondly, we calculated the average total income for every Aggregate industry. When there was a one-to-one assignment from the Census to the Aggregate, this was just the Census average total income for that industry. But if there was a many-to-one assignment, the relevant average total income was the weighted average income of the corresponding Census industries, which was equal to the sum of the total income from each Census industry divided by the total number of jobs in these industries. Finally, we assigned every Aggregate industry to one or more IO industries as designated in AVECTOR, assuming that when there was a one-to-many assignment, each of the IO industries within the same group had the same average total income. Having calculated the average total income for each of the IO industries, we then computed the job to income ratio which, to be specific, refers to the number of jobs generated per million dollars. This was simply done by dividing one million by the average total income from each industry.

Appendix B: Government Revenues

Aside from domestic output, GDP and employment, government revenue is another key factor that we may want to look at in the estimation of economic impacts. Four major types of government revenues were estimated in the 1990 provincial Input-Output model: Personal Income Taxes, Indirect Taxes Less Subsidies, Corporate Income Taxes, and Natural Resource Royalties. In the 1996 model, however, only the first two types of taxes are calculated, while the other two have been omitted from the model. Another significant change that has been made in the new model is that unlike previous models where the direct and indirect impacts on government revenues were estimated only for the No Safety Net scenario, the 1996 model presents these impacts for both Safety Net and No Safety Net scenarios respectively. This appendix explains how the two types of government revenues are calculated and why we have made changes in the model.

Personal Income Taxes

The calculation of the total personal income taxes is done by applying industry-specific tax rates (PMTM) which range from 0 to 0.24 to the total personal income of each industry. The PMTM are calculated using a formula presented in *British Columbia Local Area Economic Dependencies and Impact Ratios – 1996* (Horne, 1999):

$$\text{Effective Tax Rate (PMTM)} = 0.36 - 11516/(\text{Income} + 24270)$$

The Income used in the above formula refers to the average personal income in each industry, which is equal to the total income in each divided by the total number of jobs in that industry. This way of calculating income tax rates is consistent with the progressive tax system in Canada.

As was explained in the section regarding With and Without Safety Net, the net changes in personal income are different in these two scenarios, given the same amount of additional income generated by a project, and therefore, so are the corresponding changes in personal income taxes. Conceptually, the direct and indirect impacts on personal income taxes are smaller in the With Safety Net scenario, since in this scenario people who lose their jobs can still receive from the social safety net a certain amount of income which is taxable. Hence, we need another set of tax rates which are applicable to the income obtained from safety net. These tax rates, which are called SNT, are calculated using the same formula, with average total income being replaced with safety net income. Therefore, the effective tax rates ($PMTM_{general}$) can be written in a more general way as follows:

$$PMTM_{general} = PMTM - SNT$$

where the second term on the right hand side, SNT, is equal to zero in the No Safety Net scenario. Clearly, the personal income taxes collected in these two scenarios will not be the same due to the difference in the effective tax rates. Subsequently, not only the induced but also the direct and indirect impacts on the government revenues will be different under these two different assumptions.

Indirect Taxes Less Subsidies

Every model solution generates estimates of Indirect Taxes on Products, Subsidies and Indirect Taxes on Production. It is a challenge to allocate shares of each of these to the three levels of government – federal, provincial and municipal, and doing this requires information from outside the BCIOM.

In the case of Indirect Taxes on Products, additional information from Statistics Canada has enabled us to allocate these on an industry-specific basis to PST, GST, Federal and Provincial Gas Taxes, and other indirect taxes on Products. With these estimates in hand it is a simple matter to allocate the shares of Indirect Taxes on Products to the federal and provincial governments. (There are no municipal Indirect Taxes on Products in BC.)

In the case of Subsidies and indirect Taxes on Production, we have used historical information to distribute these to the three levels of government as follows:

Subsidies: 31.8% Federal, 64.7% Provincial, 3.6% Municipal.
Indirect Taxes on Production: 0% Federal, 49% Provincial, 51% Municipal.

Corporate Income Taxes and Natural Resource Royalties

Corporate income taxes, which are imposed on the corporation net profits, are another major type of government revenues. However, they have not been estimated in the 1996 Input-Output model due to the unavailability of the net profit data. In current BCIOM, there is no explicit entry for corporation net profits. Instead, there is one primary input called *Other operating surplus*. This surplus entry is simply created to balance the inputs and outputs of the industries. Therefore, it is, in effect, the before distribution profits, which include the before taxes and dividends profits, capital consumption allowances and various investment income. Conceptually, the net profits can be calculated by deducting from gross income those expenditures allowed under tax law and regulations. Unfortunately, the rules on the allowable deductions are very complicated, and without enough information it is too hard to allocate this before distribution profits to different categories, such as net profits, taxes, investment income etc.

Another problem involved in the estimation of the corporate income taxes is the industry volatility. In general, the input-output model is used to estimate the economic impacts of projects or policies that take place some time later than the model year, assuming that the industrial inter-relationships represented in the model have not changed in any significant way since the model year. As we know, corporation net profits are essentially affected by the corresponding industry performance, and therefore, so are the collected corporate income taxes. Hence, the estimation of corporate income taxes generated from 1996 data will be valid for years other than 1996 only if the performance of each industry does not vary significantly from year to year. Unfortunately, this is not necessarily the case in the real world. Indeed, industry performance may fluctuate greatly from year to year, making it inadvisable to use multipliers estimated using data, if available, of a particular year to predict the economic impacts with respect to corporate income taxes in some other years.

Similarly, there is a lack of data on natural resource royalties, which hindered our estimation of government revenues on natural resources.

Appendix C:

Industry Multipliers – Small Aggregation

1996 BCIOM INDUSTRY MULTIPLIERS - SMALL AGGREGATION - 75% RECYCLING RATE

	OUTPUT				GDPF/OUTPUT					EMPLOYMENT (PY/$M) 2000				
	Own	Total	SN	NSN		Own	Total	SN	NSN		Own	Total	SN	NSN
Industry	Indir	Indir	Induc	Induc	Direct	Indir	Indir	Induc	Induc	Direct	Indir	Indir	Induc	Induc
1 Agricultural and related services industries	0.23	0.75	0.15	0.37	0.38	0.11	0.31	0.08	0.21	8.60	2.55	5.90	1.36	3.38
2 Fishing and trapping industries	0.06	0.53	0.13	0.32	0.49	0.03	0.21	0.07	0.18	6.73	0.41	3.62	1.17	2.92
3 Logging and forestry industries	0.23	0.73	0.16	0.34	0.48	0.11	0.25	0.09	0.19	4.34	1.19	3.82	1.48	3.08
4 Mining, quarrying and oil well industries	0.04	0.39	0.13	0.26	0.59	0.02	0.17	0.07	0.14	3.07	0.25	2.67	1.19	2.34
5 Manufacturing industries	0.14	0.75	0.14	0.31	0.33	0.05	0.30	0.08	0.18	5.29	0.75	4.01	1.23	2.86
6 Construction industries	0.00	0.52	0.17	0.43	0.39	0.00	0.23	0.10	0.24	9.38	0.05	4.00	1.56	3.87
7 Transportation and storage industries	0.15	0.60	0.18	0.41	0.48	0.07	0.25	0.10	0.23	7.15	1.08	4.52	1.60	3.74
8 Communication and other utility ind.	0.02	0.26	0.13	0.28	0.72	0.02	0.11	0.07	0.15	5.43	0.18	2.05	1.16	2.53
9 Wholesale trade industries	0.03	0.51	0.20	0.49	0.59	0.02	0.20	0.11	0.27	10.47	0.30	3.60	1.79	4.47
10 Retail trade industries	0.01	0.50	0.23	0.56	0.62	0.01	0.20	0.13	0.32	20.34	0.17	3.59	2.06	5.14
11 Finance, insurance and real estate ind.	0.14	0.47	0.18	0.34	0.57	0.05	0.18	0.10	0.19	3.79	0.99	3.61	1.62	3.10
12 Business service industries	0.09	0.48	0.23	0.57	0.63	0.06	0.19	0.13	0.32	13.79	1.27	3.53	2.08	5.16
13 Educational service industries	0.00	0.56	0.28	0.62	0.59	0.00	0.22	0.15	0.34	12.07	0.01	3.79	2.51	5.62
14 Health and social service industries	0.00	0.28	0.25	0.62	0.79	0.00	0.12	0.14	0.34	16.54	0.01	2.05	2.24	5.62
15 Accommodation and food services ind.	0.00	0.42	0.18	0.45	0.53	0.00	0.17	0.10	0.25	18.05	0.07	3.01	1.64	4.12
16 Other service industries	0.05	0.50	0.20	0.49	0.59	0.02	0.19	0.11	0.27	16.77	0.39	3.52	1.79	4.45
17 Operating, office, cafeteria and lab. supplies	0.01	0.41	0.05	0.12	0.00	0.00	0.20	0.03	0.07	0.00	0.00	3.81	0.43	1.07
18 Travel & entert., advertising & promotion	0.03	0.98	0.11	0.28	0.00	0.00	0.47	0.06	0.15	0.00	0.00	9.98	1.03	2.53
19 Transportation margins	0.00	1.45	0.15	0.35	0.00	0.00	0.60	0.08	0.20	0.00	0.00	10.14	1.36	3.21
20 Non-profit institutions serving households	0.00	0.46	0.24	0.60	0.62	0.00	0.18	0.14	0.33	14.60	0.01	3.01	2.22	5.46
21 Government sector	0.04	0.47	0.24	0.54	0.60	0.03	0.23	0.13	0.30	9.75	0.42	4.52	2.15	4.93

SN Induc: With Safety Net Scenario. New jobs are filled by people formerly receiving assistance. Displaced workers receive assistance.
NSN Induc: No Safety Net Scenario. People without jobs have zero income.

Industry Multipliers – Medium Aggregation

1996 BCIOM INDUSTRY MULTIPLIERS - MEDIUM AGGREGATION - 75% RECYCLING RATE

	OUTPUT				GDPF/OUTPUT					EMPLOYMENT (PY/$M) 2000				
Industry	Own Indir	Total Indir	SN Induc	NSN Induc	Direct	Own Indir	Total Indir	SN Induc	NSN Induc	Direct	Own Indir	Total Indir	SN Induc	NSN Induc
1 Agricultural and related service industries	0.23	0.75	0.15	0.37	0.38	0.11	0.31	0.08	0.21	8.60	2.55	5.90	1.36	3.38
2 Fishing and trapping industries	0.06	0.53	0.13	0.32	0.49	0.03	0.21	0.07	0.18	6.73	0.41	3.62	1.17	2.92
3 Logging and forestry industries	0.23	0.73	0.16	0.34	0.48	0.11	0.25	0.09	0.19	4.34	1.19	3.82	1.48	3.08
4 Mining industries	0.00	0.41	0.14	0.27	0.52	0.00	0.17	0.08	0.15	3.16	0.01	2.56	1.31	2.48
5 Crude petroleum and natural gas industries	0.00	0.36	0.07	0.15	0.70	0.00	0.16	0.04	0.08	0.80	0.00	2.95	0.64	1.34
6 Quarry and sand pit industries	0.00	0.36	0.16	0.36	0.58	0.00	0.16	0.09	0.20	6.67	0.01	2.38	1.46	3.26
7 Services ind. incidental to mineral extraction	0.00	0.43	0.23	0.46	0.62	0.00	0.14	0.13	0.26	7.89	0.00	2.41	2.09	4.18
8 Food industries	0.10	0.75	0.11	0.28	0.28	0.02	0.27	0.06	0.16	5.52	0.40	4.89	1.03	2.56
9 Beverage industries	0.11	0.67	0.12	0.29	0.32	0.02	0.24	0.06	0.16	4.66	0.52	4.33	1.06	2.62
10 Tobacco products industry	0.00	0.00	0.48	0.93	1.00	0.00	0.00	0.27	0.52	19.22	0.00	0.01	4.37	8.46
11 Rubber products industries	0.01	0.26	0.16	0.41	0.57	0.00	0.09	0.09	0.23	14.21	0.12	1.54	1.47	3.69
12 Plastic products industries	0.03	0.32	0.11	0.28	0.39	0.01	0.13	0.06	0.16	8.47	0.21	2.12	1.03	2.57
13 Leather and allied products industries	0.00	0.27	0.16	0.40	0.46	0.00	0.11	0.09	0.22	16.80	0.01	1.92	1.44	3.63
14 Primary textile industries	0.01	0.31	0.14	0.34	0.43	0.00	0.13	0.08	0.19	7.22	0.05	2.15	1.28	3.10
15 Textile products industries	0.01	0.27	0.14	0.35	0.44	0.00	0.11	0.08	0.19	13.28	0.12	2.15	1.25	3.15
16 Clothing industries	0.05	0.28	0.15	0.38	0.44	0.02	0.12	0.08	0.21	19.68	0.87	2.83	1.36	3.42
17 Wood industries	0.06	1.09	0.16	0.36	0.29	0.02	0.43	0.09	0.20	4.50	0.29	5.36	1.44	3.31
18 Furniture and fixture industries	0.00	0.52	0.16	0.39	0.44	0.00	0.20	0.09	0.22	12.37	0.03	3.41	1.44	3.58
19 Paper and allied products industries	0.04	0.88	0.14	0.30	0.31	0.01	0.33	0.08	0.17	3.40	0.15	4.17	1.28	2.76
20 Printing, publishing and allied industries	0.06	0.47	0.18	0.45	0.56	0.03	0.19	0.10	0.25	12.55	0.81	3.06	1.64	4.08
21 Primary metal industries	0.02	0.53	0.11	0.22	0.29	0.00	0.19	0.06	0.13	3.00	0.06	2.51	0.98	2.05
22 Fabricated metal products industries	0.06	0.32	0.12	0.31	0.43	0.02	0.13	0.07	0.17	7.76	0.47	2.29	1.14	2.84
23 Machinery ind. (except electrical mach)	0.02	0.27	0.14	0.33	0.48	0.01	0.11	0.08	0.19	7.00	0.15	1.93	1.29	3.04
24 Transportation equipment industries	0.03	0.33	0.11	0.29	0.37	0.01	0.14	0.06	0.16	6.91	0.31	2.59	1.04	2.60
25 Electrical and electronic products industries	0.03	0.26	0.11	0.26	0.44	0.02	0.11	0.06	0.15	6.62	0.24	1.91	0.96	2.40
26 Non-metallic mineral products industries	0.12	0.59	0.13	0.31	0.40	0.06	0.26	0.07	0.17	6.00	0.38	3.56	1.18	2.85
27 Refined petroleum and coal products ind.	0.07	0.60	0.05	0.12	0.03	0.00	0.30	0.03	0.07	0.52	0.05	2.90	0.50	1.12
28 Chemical and chemical products industries	0.03	0.43	0.11	0.24	0.40	0.01	0.20	0.06	0.13	3.80	0.09	2.45	0.98	2.16
29 Other manufacturing industries	0.02	0.30	0.16	0.40	0.51	0.01	0.12	0.09	0.22	13.94	0.21	2.25	1.46	3.65
30 Construction industries	0.00	0.52	0.17	0.43	0.39	0.00	0.23	0.10	0.24	9.38	0.05	4.00	1.56	3.87
31 Transportation industries	0.16	0.63	0.18	0.43	0.45	0.07	0.26	0.10	0.24	7.45	1.14	4.82	1.65	3.90
32 Pipeline transport industries	0.00	0.24	0.09	0.18	0.77	0.00	0.10	0.05	0.10	2.30	0.01	1.59	0.82	1.60
33 Storage and warehousing industries	0.01	0.41	0.21	0.48	0.61	0.01	0.18	0.12	0.27	10.45	0.17	2.99	1.89	4.33
34 Communication industries	0.03	0.33	0.15	0.35	0.67	0.02	0.14	0.08	0.19	7.66	0.27	2.61	1.34	3.16
35 Other utility industries	0.00	0.17	0.10	0.18	0.78	0.00	0.06	0.06	0.10	2.42	0.00	1.30	0.91	1.68

SN Induc: With Safety Net Scenario. New jobs are filled by people formerly receiving assistance. Displaced workers receive assistance.
NSN Induc: No Safety Net Scenario. People without jobs have zero income.

1996 BCIOM INDUSTRY MULTIPLIERS - MEDIUM AGGREGATION - 75% RECYCLING RATE

Industry	OUTPUT				GDPF/OUTPUT					EMPLOYMENT (PY/$M) 2000				
	Own Indir	Total Indir	SN Induc	NSN Induc	Direct	Own Indir	Total Indir	SN Induc	NSN Induc	Direct	Own Indir	Total Indir	SN Induc	NSN Induc
36 Wholesale trade industries	0.03	0.51	0.20	0.49	0.59	0.02	0.20	0.11	0.27	10.47	0.30	3.60	1.79	4.47
37 Retail trade industries	0.01	0.50	0.23	0.56	0.62	0.01	0.20	0.13	0.32	20.34	0.17	3.59	2.06	5.14
38 Finance & real estate industries	0.16	0.67	0.16	0.39	0.45	0.05	0.25	0.09	0.22	6.17	1.18	4.95	1.46	3.53
39 Insurance industries	0.02	0.87	0.20	0.46	0.31	0.00	0.36	0.11	0.26	5.79	0.09	6.80	1.80	4.23
40 Owner occupied dwellings	0.00	0.12	0.20	0.25	0.78	0.00	0.06	0.11	0.14	0.00	0.00	1.13	1.81	2.28
41 Business service industries	0.09	0.48	0.23	0.57	0.63	0.06	0.19	0.13	0.32	13.79	1.27	3.53	2.08	5.16
42 Educational service industries	0.00	0.56	0.28	0.62	0.59	0.00	0.22	0.15	0.34	12.07	0.01	3.79	2.51	5.62
43 Health and social service industries	0.00	0.28	0.25	0.62	0.79	0.00	0.12	0.14	0.34	16.54	0.01	2.05	2.24	5.62
44 Accommodation and food services ind.	0.00	0.42	0.18	0.45	0.53	0.00	0.17	0.10	0.25	18.05	0.07	3.01	1.64	4.12
45 Amusement and recreational service ind.	0.09	0.63	0.18	0.43	0.48	0.03	0.23	0.10	0.24	12.39	0.48	4.48	1.59	3.95
46 Personal & household service industries	0.01	0.28	0.23	0.58	0.70	0.00	0.11	0.13	0.33	29.05	0.15	2.10	2.11	5.32
47 Other service industries	0.02	0.51	0.20	0.48	0.61	0.01	0.19	0.11	0.27	14.28	0.22	3.51	1.78	4.40
48 Operating, office, cafeteria and lab. supplies	0.01	0.41	0.05	0.12	0.00	0.00	0.20	0.03	0.07	0.00	0.00	3.81	0.43	1.07
49 Travel & entert., advertising & promotion	0.03	0.98	0.11	0.28	0.00	0.00	0.47	0.06	0.15	0.00	0.00	9.98	1.03	2.53
50 Transportation margins	0.00	1.45	0.15	0.35	0.00	0.00	0.60	0.08	0.20	0.00	0.00	10.14	1.36	3.21
51 N.B. - P Non-profit org. excl. education	0.00	0.49	0.24	0.59	0.60	0.00	0.20	0.13	0.33	14.62	0.01	3.20	2.15	5.38
52 N.B. - P Educational institutions	0.00	0.25	0.30	0.66	0.75	0.00	0.10	0.17	0.37	14.51	0.00	1.76	2.70	5.97
53 N.B. - G Hospitals and res. care facilities	0.00	0.24	0.27	0.61	0.76	0.00	0.10	0.15	0.34	13.71	0.01	2.03	2.46	5.56
54 N.B. - G Education	0.01	0.24	0.29	0.63	0.79	0.01	0.10	0.16	0.35	13.84	0.14	1.78	2.63	5.77
55 N.B. - G Defence services	0.00	0.37	0.17	0.40	0.50	0.00	0.14	0.09	0.22	8.06	0.00	2.73	1.51	3.60
56 N.B. - G Other municipal govt.	0.03	0.43	0.19	0.46	0.66	0.02	0.20	0.11	0.26	9.00	0.24	3.66	1.75	4.19
57 N.B. - G Other provincial & territorial govt.	0.01	0.81	0.21	0.50	0.35	0.00	0.45	0.12	0.28	4.96	0.04	8.88	1.94	4.53
58 N.B. - G Other federal govt.	0.00	0.37	0.22	0.52	0.69	0.00	0.16	0.12	0.29	10.73	0.04	3.06	2.04	4.75

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Government Revenue Multipliers – Small Aggregation

1996 BCIOM GOVERNMENT REVENUE MULTIPLIERS - SMALL AGGREGATION - 75% RECYCLING RATE

Industry	FEDERAL TAXES				PROVINCIAL TAXES				MUNICIPAL TAXES			
	SN	NSN	SN	NSN	SN	NSN	SN	NSN	SN	NSN	SN	NSN
	Dir+Ind	Dir+Ind	Induc	Induc	Dir+Ind	Dir+Ind	Induc	Induc	Dir+Ind	Dir+Ind	Induc	Induc
1 Agricultural and related services industries	0.028	0.038	0.007	0.020	0.028	0.033	0.015	0.039	0.014	0.014	0.004	0.009
2 Fishing and trapping industries	0.036	0.047	0.006	0.017	0.034	0.039	0.013	0.034	0.005	0.005	0.003	0.008
3 Logging and forestry industries	0.041	0.052	0.007	0.018	0.041	0.047	0.016	0.036	0.007	0.007	0.004	0.008
4 Mining, quarrying and oil well industries	0.033	0.041	0.006	0.013	0.043	0.047	0.013	0.027	0.012	0.012	0.003	0.006
5 Manufacturing industries	0.032	0.043	0.006	0.016	0.033	0.039	0.014	0.033	0.007	0.007	0.003	0.008
6 Construction industries	0.038	0.053	0.008	0.022	0.064	0.072	0.017	0.045	0.011	0.011	0.004	0.011
7 Transportation and storage industries	0.032	0.047	0.008	0.022	0.043	0.050	0.018	0.043	0.014	0.014	0.004	0.010
8 Communication and other utility ind.	0.029	0.039	0.006	0.015	0.045	0.050	0.013	0.029	0.022	0.022	0.003	0.007
9 Wholesale trade industries	0.051	0.071	0.009	0.026	0.049	0.059	0.020	0.052	0.010	0.010	0.005	0.012
10 Retail trade industries	0.045	0.058	0.010	0.030	0.048	0.055	0.023	0.059	0.016	0.016	0.006	0.014
11 Finance, insurance and real estate ind.	0.031	0.041	0.008	0.018	0.073	0.078	0.018	0.036	0.056	0.056	0.004	0.009
12 Business service industries	0.049	0.070	0.010	0.030	0.042	0.053	0.023	0.060	0.007	0.007	0.006	0.014
13 Educational service industries	0.078	0.101	0.012	0.032	0.059	0.071	0.028	0.065	0.017	0.017	0.007	0.016
14 Health and social service industries	0.048	0.072	0.011	0.032	0.012	0.024	0.025	0.065	0.005	0.005	0.006	0.016
15 Accommodation and food services ind.	0.035	0.044	0.008	0.024	0.050	0.054	0.018	0.048	0.014	0.014	0.005	0.011
16 Other service industries	0.042	0.054	0.009	0.026	0.045	0.051	0.020	0.051	0.012	0.012	0.005	0.012
17 Operating, office, cafeteria and lab. supplies	0.014	0.018	0.002	0.006	0.042	0.044	0.005	0.012	0.002	0.002	0.001	0.003
18 Travel & entert., advertising & promotion	0.047	0.056	0.005	0.015	0.065	0.069	0.011	0.029	0.008	0.008	0.003	0.007
19 Transportation margins	0.040	0.053	0.007	0.019	0.059	0.065	0.015	0.037	0.013	0.013	0.004	0.009
20 Non-profit institutions serving households	0.063	0.086	0.011	0.032	0.051	0.063	0.025	0.063	0.010	0.010	0.006	0.015
21 Government sector	0.056	0.076	0.011	0.028	0.039	0.050	0.024	0.057	0.005	0.005	0.006	0.014

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Government Revenue Multipliers – Medium Aggregation

1996 BCIOM GOVERNMENT REVENUE MULTIPLIERS - MEDIUM AGGREGATION - 75% RECYCLING RATE

Industry	FEDERAL TAXES				PROVINCIAL TAXES				MUNICIPAL TAXES			
	SN Dir+Ind	NSN Dir+Ind	SN Induc	NSN Induc	SN Dir+Ind	NSN Dir+Ind	SN Induc	NSN Induc	SN Dir+Ind	NSN Dir+Ind	SN Induc	NSN Induc
1 Agricultural and related service industries	0.028	0.038	0.007	0.020	0.028	0.033	0.015	0.039	0.014	0.014	0.004	0.009
2 Fishing and trapping industries	0.036	0.047	0.006	0.017	0.034	0.039	0.013	0.034	0.005	0.005	0.003	0.008
3 Logging and forestry industries	0.041	0.052	0.007	0.018	0.041	0.047	0.016	0.036	0.007	0.007	0.004	0.008
4 Mining industries	0.038	0.046	0.006	0.014	0.054	0.059	0.015	0.029	0.017	0.017	0.004	0.007
5 Crude petroleum and natural gas industries	0.018	0.022	0.003	0.008	0.024	0.026	0.007	0.016	0.007	0.007	0.002	0.004
6 Quarry and sand pit industries	0.040	0.054	0.007	0.019	0.047	0.054	0.016	0.038	0.006	0.006	0.004	0.009
7 Services ind. incidental to mineral extraction	0.053	0.069	0.010	0.024	0.042	0.050	0.023	0.048	0.004	0.004	0.006	0.012
8 Food industries	0.022	0.031	0.005	0.015	0.021	0.025	0.011	0.030	0.006	0.006	0.003	0.007
9 Beverage industries	0.026	0.036	0.005	0.015	0.026	0.031	0.012	0.030	0.007	0.007	0.003	0.007
10 Tobacco products industry	0.111	0.141	0.022	0.049	0.058	0.073	0.049	0.098	0.000	0.000	0.012	0.023
11 Rubber products industries	0.031	0.042	0.007	0.021	0.024	0.030	0.016	0.043	0.003	0.003	0.004	0.010
12 Plastic products industries	0.022	0.030	0.005	0.015	0.020	0.024	0.011	0.030	0.004	0.004	0.003	0.007
13 Leather and allied products industries	0.027	0.035	0.007	0.021	0.022	0.026	0.016	0.042	0.005	0.005	0.004	0.010
14 Primary textile industries	0.031	0.045	0.006	0.018	0.025	0.032	0.014	0.036	0.003	0.003	0.004	0.009
15 Textile products industries	0.024	0.032	0.006	0.018	0.020	0.024	0.014	0.036	0.003	0.003	0.003	0.009
16 Clothing industries	0.021	0.025	0.007	0.020	0.016	0.018	0.015	0.039	0.003	0.003	0.004	0.009
17 Wood industries	0.037	0.051	0.007	0.019	0.038	0.045	0.016	0.038	0.007	0.007	0.004	0.009
18 Furniture and fixture industries	0.030	0.040	0.007	0.021	0.025	0.030	0.016	0.041	0.005	0.005	0.004	0.010
19 Paper and allied products industries	0.033	0.044	0.006	0.016	0.042	0.047	0.014	0.032	0.010	0.010	0.004	0.008
20 Printing, publishing and allied industries	0.036	0.050	0.008	0.024	0.029	0.036	0.018	0.047	0.005	0.005	0.005	0.011
21 Primary metal industries	0.025	0.033	0.005	0.012	0.028	0.032	0.011	0.024	0.006	0.006	0.003	0.006
22 Fabricated metal products industries	0.026	0.038	0.006	0.016	0.021	0.027	0.013	0.033	0.004	0.004	0.003	0.008
23 Machinery ind. (except electrical mach)	0.031	0.044	0.006	0.018	0.022	0.029	0.014	0.035	0.004	0.004	0.004	0.008
24 Transportation equipment industries	0.025	0.034	0.005	0.015	0.020	0.025	0.012	0.030	0.003	0.003	0.003	0.007
25 Electrical and electronic products industries	0.022	0.032	0.005	0.014	0.018	0.023	0.011	0.028	0.003	0.003	0.003	0.007
26 Non-metallic mineral products industries	0.029	0.040	0.006	0.016	0.034	0.040	0.013	0.033	0.007	0.007	0.003	0.008
27 Refined petroleum and coal products ind.	0.051	0.056	0.002	0.006	0.058	0.060	0.006	0.013	0.006	0.006	0.001	0.003
28 Chemical and chemical products industries	0.025	0.034	0.005	0.012	0.038	0.042	0.011	0.025	0.012	0.012	0.003	0.006
29 Other manufacturing industries	0.030	0.040	0.007	0.021	0.022	0.028	0.016	0.042	0.003	0.003	0.004	0.010
30 Construction industries	0.038	0.053	0.008	0.022	0.064	0.072	0.017	0.045	0.011	0.011	0.004	0.011
31 Transportation industries	0.033	0.049	0.008	0.022	0.042	0.050	0.018	0.045	0.012	0.012	0.005	0.011
32 Pipeline transport industries	0.022	0.028	0.004	0.009	0.043	0.046	0.009	0.019	0.023	0.023	0.002	0.004
33 Storage and warehousing industries	0.047	0.064	0.009	0.025	0.071	0.079	0.021	0.050	0.038	0.038	0.005	0.012
34 Communication industries	0.032	0.045	0.007	0.018	0.038	0.044	0.015	0.036	0.010	0.010	0.004	0.009
35 Other utility industries	0.025	0.031	0.004	0.010	0.055	0.058	0.010	0.019	0.038	0.038	0.003	0.005

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1996 BCIOM GOVERNMENT REVENUE MULTIPLIERS - MEDIUM AGGREGATION - 75% RECYCLING RATE

	FEDERAL TAXES				PROVINCIAL TAXES				MUNICIPAL TAXES			
	SN	NSN	SN	NSN	SN	NSN	SN	NSN	SN	NSN	SN	NSN
Industry	Dir+Ind	Dir+Ind	Induc	Induc	Dir+Ind	Dir+Ind	Induc	Induc	Dir+Ind	Dir+Ind	Induc	Induc
36 Wholesale trade industries	0.051	0.071	0.009	0.026	0.049	0.059	0.020	0.052	0.010	0.010	0.005	0.012
37 Retail trade industries	0.045	0.058	0.010	0.030	0.048	0.055	0.023	0.059	0.016	0.016	0.006	0.014
38 Finance & real estate industries	0.045	0.060	0.007	0.020	0.075	0.083	0.016	0.041	0.049	0.049	0.004	0.010
39 Insurance industries	0.061	0.079	0.009	0.024	0.102	0.111	0.020	0.049	0.065	0.065	0.005	0.012
40 Owner occupied dwellings	0.006	0.007	0.009	0.013	0.065	0.066	0.020	0.026	0.065	0.065	0.005	0.006
41 Business service industries	0.049	0.070	0.010	0.030	0.042	0.053	0.023	0.060	0.007	0.007	0.006	0.014
42 Educational service industries	0.078	0.101	0.012	0.032	0.059	0.071	0.028	0.065	0.017	0.017	0.007	0.016
43 Health and social service industries	0.048	0.072	0.011	0.032	0.012	0.024	0.025	0.065	0.005	0.005	0.006	0.016
44 Accommodation and food services ind.	0.035	0.044	0.008	0.024	0.050	0.054	0.018	0.048	0.014	0.014	0.005	0.011
45 Amusement and recreational service ind.	0.039	0.051	0.008	0.023	0.043	0.049	0.018	0.046	0.013	0.013	0.004	0.011
46 Personal & household service industries	0.039	0.048	0.010	0.031	0.040	0.044	0.024	0.061	0.009	0.009	0.006	0.015
47 Other service industries	0.045	0.059	0.009	0.025	0.048	0.055	0.020	0.051	0.013	0.013	0.005	0.012
48 Operating, office, cafeteria and lab. supplies	0.014	0.018	0.002	0.006	0.042	0.044	0.005	0.012	0.002	0.002	0.001	0.003
49 Travel & entert., advertising & promotion	0.047	0.056	0.005	0.015	0.065	0.069	0.011	0.029	0.008	0.008	0.003	0.007
50 Transportation margins	0.040	0.053	0.007	0.019	0.059	0.065	0.015	0.037	0.013	0.013	0.004	0.009
51 N.B. - P Non-profit org. excl. education	0.062	0.085	0.011	0.031	0.052	0.063	0.024	0.062	0.011	0.011	0.006	0.015
52 N.B. - P Educational institutions	0.069	0.094	0.013	0.034	0.047	0.059	0.030	0.069	0.007	0.007	0.007	0.016
53 N.B. - G Hospitals and res. care facilities	0.062	0.085	0.012	0.032	0.040	0.052	0.027	0.064	0.002	0.002	0.007	0.015
54 N.B. - G Education	0.068	0.092	0.013	0.033	0.040	0.052	0.029	0.067	0.002	0.002	0.007	0.016
55 N.B. - G Defence services	0.039	0.055	0.007	0.021	0.030	0.038	0.017	0.042	0.002	0.002	0.004	0.010
56 N.B. - G Other municipal govt.	0.050	0.068	0.009	0.024	0.036	0.046	0.019	0.048	0.003	0.003	0.005	0.012
57 N.B. - G Other provincial & territorial govt.	0.049	0.067	0.010	0.026	0.039	0.048	0.022	0.052	0.008	0.008	0.005	0.013
58 N.B. - G Other federal govt.	0.052	0.073	0.010	0.027	0.044	0.054	0.023	0.055	0.012	0.012	0.006	0.013

SN Induc: With Safety Net Scenario. New jobs are filled by people formerly receiving assistance. Displaced workers receive assistance.
NSN Induc: No Safety Net Scenario. People without jobs have zero income.